

## RED CREEK RESERVOIR (Iron County)



### Introduction

Red Creek Reservoir is on the face of the Markagunt Plateau as it drops into Paragonah. It is a small impoundment in a high meadow. There is another reservoir of this name in north of Fruitland in Duchesne County, hence (Iron County) or (Paragonah) is often added as a suffix to the name.

The reservoir shoreline is owned and administered by the Dixie National Forest with unrestricted public access. Defined beneficial uses include: water recreation excluding swimming, propagation of cold water species of game fish and aquatic life, and agricultural needs.

### Recreation

#### Characteristics and Morphometry

Lake elevation (meters / feet)	2,376 / 7,794
Surface area (hectares / acres)	25 / 62
Watershed area (hectares / acres)	2,074 / 5,120
Volume (m <sup>3</sup> / acre-feet)	
capacity	1,677,880 / 1,360
conservation pool	431,550 / 350
Annual inflow (m <sup>3</sup> / acre-feet)	
Retention time (years)	
Drawdown (m <sup>3</sup> / acre-feet)	1,245,330 / 1,010
Depth (meters / feet)	
maximum	9.5 / 31
mean	6.7 / 22
Length (meters / feet)	1,300 / 4,265
Width (meters / feet)	300 / 984
Shoreline (meters / feet)	3,058 / 10,033

#### Location

County	Iron
Longitude / Latitude	110 51 13 / 40 18 33
USGS Map	Red Creek Reservoir, Utah, 1971
Cataloging Unit	Cedar City (14060004)

Red Creek Reservoir is accessible from FS-078, a gravel road leading up the face of the Markagunt Plateau. Access is easiest from downtown Paragonah, where FS-078 begins, bearing due east. Red Creek Reservoir is 8 miles up Red Creek Canyon from Paragonah. Access is also possible from the north shore of Panguitch Lake, where FS-076 begins and eventually meets the other terminus of FS -

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078. This is a 12 mile route on graded dirt road.

Fishing, boating, and camping are possible in the area. Usage is light.

There are no improved recreational facilities at the reservoir except for restroom facilities. The nearest private or Forest Service campgrounds are at Panguitch Lake. There are no public or private campgrounds in the Paragonah/Parowan area.

### Watershed Description

The reservoir is on the Markagunt Plateau, but is several miles north of the steep northwest face, which dwindles into a range of hills. Red Creek Reservoir is an impoundment of a midelevation meadow in mountainous terrain, uplifted by repeated movements of the Hurricane Fault below. Yankee Meadow is on a bench area, above the Pink Cliff formation but below the steep upper face of volcanic rock that caps the plateau.

The watershed high point, is 3,064 m (10,054 ft) above sea level, thereby developing a complex slope of 12.7% to the reservoir. The inflow and outflow is Red Creek, and the average stream gradient above the reservoir is 8.7% (457 feet per mile).

The soil is of volcanic origin with moderate permeability and moderately slow erosion and runoff. A listing of the soil types is in Appendix III.

The vegetation communities are comprised of pine, aspen, spruce-fir, oak, and maple. The watershed receives 41 - 51 cm (16 - 20 inches) of precipitation annually with a frost-free season of 40 - 60 days at the reservoir.

### Limnological Assessment

The water quality of Red Creek Reservoir is fairly good. It is considered to be moderately hard with a hardness concentration value of approximately 181 mg/L (CaCO<sub>3</sub>). Those parameters that have exceeded State water quality standards for defined beneficial uses are total phosphorus and dissolved oxygen. The average concentrations of total phosphorus in the water column for 1992 was 132 ug/L which exceeds the recommended pollution indicator for phosphorus of 25 ug/L. The phosphorus concentration in the hypolimnion averaged 305 ug/L for the same period. Dissolved oxygen concentrations in early summer substantiate the fact that water quality impairments do exist. Concentrations on June 16, 1992 ranged from 7.2 to 1.7 mg/L downward in the water column. These conditions support the fact that there is a large demand in the hypolimnion at the sediment interface for oxygen indicative of large accumulation of organic material usually from high productivity over an extended period of time.

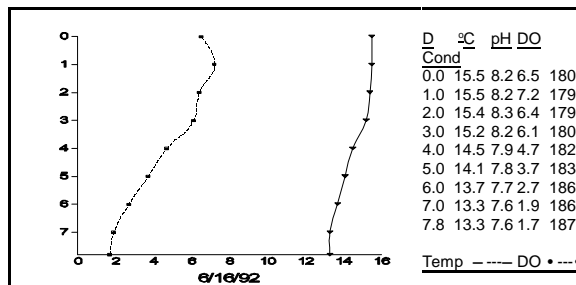
The 1992 data suggest that the reservoir is currently a nitrogen limited system. TSI values indicate the reservoir

is moderately eutrophic with relatively high concentrations of phosphorus present. The reservoir has not been stratified during any recent monitoring trips which is indicative of the limited depth and early drawdown due to

Limnological Data	
Data averaged from STORET site: 594180	
<b>Surface Data</b> 1992	
Trophic Status	E
Chlorophyll TSI	51.18
Secchi Depth TSI	47.69
Phosphorous TSI	60.56
Average TSI	53.14
Chlorophyll <i>a</i> (ug/L)	8.2
Transparency (m)	2.4
Total Phosphorous (ug/L)	50
pH	8.9
Total Susp. Solids (mg/L)	<5.5
Total Volatile Solids (mg/L)	2
Total Residual Solids (mg/L)	4
Temperature (°C / °f)	18/64
Conductivity (umhos/cm)	169
<b>Water Column Data</b>	
Ammonia (mg/L)	.24
Nitrate/Nitrite (mg/L)	0.038
Hardness (mg/L)	81.1
Alkalinity (mg/L)	84
Silica (mg/L)	22.8
Total Phosphorous (ug/L)	132
<b>Miscellaneous Data</b>	
Limiting Nutrient	N
DO (Mg/l) at 75% depth	7.4
Stratification (m)	NO
Depth at Deepest Site (m)	3.7

downstream irrigation needs.

According to DWR no fish kills have been reported in recent years. The reservoir supports a populations of rainbow trout (*Oncorhynchus mykiss*). The DWR stocks the reservoir annually with 2,000 fingerling rainbow trout. The lake has not been treated for rough fish competition, so populations of native fishes may still be



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present in the lake.

Phytoplankton in the euphotic zone include the following taxa (in order of dominance)

Species	Cell Volume (mm <sup>3</sup> /liter)	% Density By Volume
<i>Gloetrichia echinulata</i>	55.600	63.88
<i>Stephanodiscus niagarae</i>	23. 6 6 3	27.19
<i>Anabaena spiroides</i>		
var. <i>crassa</i>	2.891	3.32
<i>Sphaerocystis schroeteri</i>	2.641	3.03
<i>Microcystis aeruginosa</i>	1.101	1.26
<i>Melosira granulata</i>	1.090	1.25
<i>Oocystis</i> sp.	0.025	0.03
Pennate diatoms	0.012	0.01
Centric diatoms	0.007	0.01
<i>Haematococcus</i> sp.	0.003	0.00
Total	87.026	
Shannon-Weaver [H']	0.97	
Species Evenness	0.42	
Species Richness	0.36	

The phytoplankton community is dominated by the presence of blue-green algae and diatoms indicative of eutrophic conditions and limited water quality.

### Pollution Assessment

Nonpoint pollution sources include: sedimentation and nutrient loading from grazing and wastes or litter from recreation. Cattle graze in the watershed, around the reservoir and even in the reservoir in late summer when the macrophytes emerge near the shoreline..

There are no point pollution sources in the watershed.

### Beneficial Use Classification

The state beneficial use classifications include: boating and similar recreation (excluding swimming) (2B), cold water game fish and organisms in their food chain (3A) and agricultural uses (4).

#### Information

Dixie National Forest	586-2421
Ranger District	
Five County Association of Governments	
Division of Wildlife Resources	896-6666
Division of Water Quality	538-6146